

CLAIMS

What is claimed is:

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1 1. A stage device, comprising:

2 a movable stage which has a first portion to support an
3 object and a second portion;

4 a drive mechanism which drives said movable stage in at
5 least a first direction, at least part of the drive mechanism being
6 coupled to said second portion;

7 a first position detector which optically detects the position
8 of said first portion in a predetermined first—measurement
9 ~~direction, said first position detector being optically connected to~~
10 ~~said first portion; and~~

11 a second position detector which optically detects the
12 position of said second portion in said predetermined first
13 measurement ~~direction, said second position detector being~~
14 ~~optically connected to said second portion.~~

1 2. The stage according to claim 1, further comprising:

2 a stage controller which controls said drive mechanism
3 based on a detection result obtained by said first position detector
4 and said second position detector.

1 3. The stage device according to claim 1, wherein said first
2 portion and said second portion are integrally formed.

1 4. The stage device according to claim 1, wherein said drive
2 mechanism comprises a linear motor.

1 5. An exposure apparatus which transfers a pattern of a mask
2 onto an object, comprising:

3 an object stage which has a first portion to support said
4 object and a second portion;

5 a drive mechanism which drives said object stage in at
6 least a first direction, at least part of the drive mechanism being
7 coupled the second portion;

8 a first position detector which optically detects the position
9 of said first portion in a predetermined first—measurement
10 ~~direction, said first portion detector being optically connected to~~
11 ~~said first portion; and~~

12 a second position detector which optically detects the
13 position of said second portion in said predetermined first
14 measurement ~~direction, said second position detector being~~
15 ~~optically connected to said second portion.~~

1 6. The exposure apparatus according to claim 5, further
2 comprising:

3 a stage controller which controls the drive based on a
4 detection result obtained by said first position detector and said
5 second position detector.

1 7. The exposure apparatus according to claim 5, wherein the
2 exposure apparatus is a scanning type exposure apparatus
3 which transfers said pattern while causing said mask and
4 said object to move simultaneously.

1 8. The exposure apparatus according to claim 6, further
2 comprising a projection system which projects said pattern
3 onto said object, said projection system disposed between
4 said mask and said object.

1 9. The exposure apparatus according to claim 8, further
2 comprising a second drive mechanism which drives said
3 object along an axis direction of said projection system.

1 10. The exposure apparatus according to claim 1, further
2 comprising a second drive mechanism which drives said
3 object in a direction different from said first direction.

1 11. An exposure device which exposes a pattern of a mask
2 onto a substrate, comprising:

3 a mask stage which positions said mask;

4 a substrate stage which positions said substrate;

5 a position detecting device which detects the position of at
6 least one of said mask stage and said substrate stage, said
7 position detecting device having a moving mirror fixed to at least
8 one of said mask stage and said substrate stage, and a fixed
9 mirror fixed to a reference unit;

10 a correction device which corrects for differences in said
11 detected position which result from vibration of said fixed mirror;
12 and

13 a control device which controls the position of said mask
14 and substrate stages in at least one direction based on an output
15 from said correction device.

1 12. The exposure device according to claim 11, further
2 comprising a projection optical system disposed between said
3 mask and said substrate, said fixed mirror being disposed in said
4 projection optical system, an image of said pattern being projected
5 onto said substrate by said projection optical system.

1 13. The exposure device according to claim 11, wherein said
2 position detection device detects the position of at least one of
3 said mask stage and said substrate stage based on light reflected
4 by a fixed mirror arranged in a reference unit, and light which is
5 reflected by a moving mirror disposed in at least one of said mask
6 stage and said substrate stage, said position detection device

7 including a correction device which corrects for an error which
8 originates from vibration of said fixed mirror, and a control device
9 which controls said mask and substrate stages based on an
10 output from said correction device.

1 14. The exposure device according to claim 13, wherein said
2 correction device is a low pass filter.

1 15. The exposure device according to claim 13, wherein said
2 correction device is one which corrects for said error based on
3 stage instruction signals which dictate movement of said mask
4 and substrate stages.

1 16. A method of manufacturing an exposure device, comprising
2 the steps of:
3 providing a stage device having a first stage which movably
4 supports an object;
5 providing a drive mechanism which drives said first stage in
6 at least a first direction, said first stage having a first portion
7 coupled to said drive mechanism and a second portion for
8 supporting said object, said first stage device configured with a
9 first position measuring device which measures the position of
10 said first portion in a predetermined measurement direction;
11 providing a first stage control system which controls said
12 drive mechanism to control the position of said object in said at
13 least a first direction based on a measurement result obtained by
14 said first position measuring device; and
15 assembling said stage device, said drive mechanism, and
16 said first stage control system to produce a corresponding
17 exposure device.
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